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# USSR Report

ENERGY

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7 March 1986

# USSR REPORT

## ENERGY

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OIL AND GAS

1985 SOCIALIST OBLIGATIONS, AZERBAIJAN

Baku AZERBAYDZHANSKOYE NEFTYANOYE KHOZYAYSTVO in Russian No 2 Feb 85 pp 1-6

[Article: "1985 Socialist Obligations for Enterprise and Organization Collectives"]

[Text] Azneft Association:

In actualizing the resolutions of the 26th CPSU Congress and subsequent CPSU Central Committee Plenums, workers, engineering-technical personnel and employees of the Azneft p/o [production association], marching forward towards the 40th anniversary of the victory of the Soviet people in World War II and the 50th anniversary of the Stakhanov movement, have developed socialist competition for successful fulfillment and overfulfillment of the state plan for the concluding year of the 11th Five-Year Plan.

Governed by the directives of the October (1984) CPSU Central Committee Plenum, the Azneft p/o collective, striving through its selfless labor to make a worthy contribution to strengthening the country's fuel-energy base and having evaluated its reserves and opportunities, assume the following socialist obligations for 1985.

On the basis of ensuring smooth operation of its enterprises and organizations, making the best use of the available wells, reducing manual labor, introducing the brigade form of labor organization, accelerating the start-up of new capacities, strengthening discipline and reducing losses of working time:

- reduce the net cost of crude oil production and lower operating expenditures by 0.5 percent as against the plan;

- produce 3,000 tons of petroleum above the plan, including 1,000 tons by the 40th anniversary of victory in World War II and 1,700 tons by the 50th anniversary of the Stakhanov movement;

- produce 12.0 million cubic meters of gas above the plan, including 3.0 million by the 40th anniversary of victory in World War II and 6.0 million by the 50th anniversary of the Stakhanov movement;

- drill 1,500 m above the plan, including 1,000 m in development drilling and 500 m in exploration drilling;

- put four producing wells into operation above the plan;

- ensure the marketing of 300,000 rubles worth of industrial output above the plan.

**In oil production:**

- lower specific labor per-well servicing expenditures by 1.8 percent as against the 1984 plan;
- exceed the oil production plan assignment for new methods of increasing bed yields by 2,000 tons;
- reactivate five wells inactive at assigned production limits;
- undertake 200 geology projects and 40 projects testing the vicinity of well bottoms above the plan;
- ensure continued improvement in well routine maintenance and major overhaul quality, avoid maintenance accidents and defects;
- consistently struggle to improve production standards by improving workplace maintenance, working and recreation conditions for the workers;
- to protect water resources, stop all discharges of oilfield wastewater into the Caspian Sea;
- to protect land, turn over 10 ha of recultivated land to its previous users;
- to protect the atmosphere, reduce total discharges of hazardous substances by 100 tons, trap and neutralize 100 tons of hazardous substances.

**In drilling and prospecting:**

- ensure that 70.0 percent of the producing wells are built by the brigade contract method;
- improve prospecting and drilling effectiveness and quality by concentrating them in the Kura-Iori interfluvium and the Yevlakh-Agdzhabedinskiy trough, increasing exploration drilling to 72,000 m to ensure an increment in petroleum reserves of industrial quality in the Tarsdallyar and Dzhafarly areas;
- begin exploratory drilling in the Molladag, B. Palantekya and western Gyur-zundag areas; start up a parametric well in the Akhtakhtatepe area; estimate the oil-bearing capacity of Middle Eocene deposits in the Gyurzundag area in 1985.

**In building production capacities and putting them into operation:**

- in oilfield construction, outstripping growth in fixed-assets start-up in comparison with capital investment growth; reduce unfinished construction to the normative level;
- ensure the start-up of production capacities on schedule;
- increase labor productivity in construction done by association construction organizations by 1.0 percent as against the plan.

**In the area of scientific-technical progress:**

- achieve an economic impact totalling 2,960,000 rubles by improving the quality of developments, accelerating their use in production, introducing new equipment and progressive technology, mechanizing and automating production processes, and using inventions and efficiency proposals;
- drill 1,000 m above the established plan for developing science and technology by using highly effective GN, GNU and GAU bits with sealed bearing assemblies.

**In the area of saving materials and fuel-energy resources:**

- save 8.0 million kW-hr of electricity, 750 Gcal of thermal energy and 540 t of standard fuel by introducing technological processes with lower energy expenditures, replacing and modernizing technological and power equipment, and strictly monitoring operating conditions (the equivalent of two days' work per year);

save 1,390 tons of cement, 930 m<sup>3</sup> of lumber, 120 t of metal, 65 t of gasoline and 50 t of diesel fuel on the basis of introducing leading experience into practice, perfecting technological processes and reducing losses and nonproductive expenditures.

In the area of social development of the collective:

continue working to improve working, everyday living and recreation conditions for oilmen, with 23,241 m<sup>2</sup> of housing to be put into operation in 1985. Carry out measures to improve sanitation-hygiene working conditions on the job, at a total cost of 1.177 million rubles;

finish recording, registering and certifying jobs at association machine-building enterprises. Organizational and methods work to record, register and certify jobs at petroleum extraction and drilling enterprises;

actualize the resolutions of the May (1982) CPSU Central Committee Plenum by taking the steps necessary to improve worker supply by creating and strengthening the material-technical base of subsidiary farms, producing 126 tons of meat (live weight), 800,000 eggs, 348 tons of grain and 158.5 tons of vegetables;

to provide association enterprises and organizations with skilled personnel, improve the skills of 50 workers above the plan (on-the-job) and provide 30 engineering-technical people with production-technical training above the plan. Provide 12,000 engineering-technical workers and employees with economic training in the 1984-1985 academic year.

The socialist obligations were discussed and adopted at labor collective meetings of the Azneft p/o.

VPO Kasporneftegazprom [All-Union Production Association]

Governed by the resolutions of the 26th CPSU Congress and subsequent CPSU Central Committee Plenums, the labor collectives of VPO Kasporneftegazprom enterprises and associations have concluded 1984 with a new contribution to mastering and developing the petroleum and gas deposits of the Caspian.

By continuing exploratory prospecting in the Apsheron and Baku Archipelago areas and the Turkmen and Kazakhstan shelf, association workers have ensured overfulfillment of plan assignments for increasing petroleum (with condensate) and gas reserves.

Intensive drilling and well operation is in progress at the promising imeni 28 April deposit from stationary deep-water platforms we manufactured ourselves and installed where the water is more than 100 m deep.

As a result of implementation of a large complex of geologic-engineering measures, construction development of deposits and steps to improve labor organization, the VPO Kasporneftegazprom collective successfully coped with the 1984 plan in terms of petroleum and gas extraction. The level of oil production not only stabilized, but rose by 48,500 tons, or 0.5 percent, as against 1983. Above-plan production was 90,000 tons of petroleum and 251.3 million cubic meters of gas for the year.

Plans were overfulfilled and socialist obligations were taken on for the most important industrial production indicators. More than 11.0 million rubles worth



of output above the plan was marketed in 1984, labor productivity rose by 1.2 percent and output net cost dropped by 3.0 percent.

The selfless labor of workers and engineers and the widespread development of socialist competition were manifested in these achievements.

Many labor collectives of enterprises, shops and brigades carried out the plans for 1984 and the first four years of the five-year plan ahead of schedule. They include these winners of the All-Union Socialist Competition: workers at the p/o imeni 22nd CPSU Congress and the Kaspneftegazflot administration, drilling brigades led by Surid Dzhafar-zad (Neftyanyye Kamni UBR [not further identified]), Eduard Aslanov (Bulla URB [not further identified]), Dashadamir Abdurakhmanov (Bukhta Iliche URB) and Agasi Akhmedov (Sangachalsk UBR), oil and gas production brigades led by Musa Mamedaliyev (NGDU [not further identified] imeni N. Narimanov) and Khadzhiniyaz Tachev (p/o Chelekenmorneftegazprom), the routine well maintenance and major overhaul brigade led by Adyl Mamedov (p/o imeni 22nd CPSU Congress), Guseyn Guseynov (NGDU Artemneftegaz) and others.

VPO Kasporneftegazprom workers, in an effort to greet the 27th Party Congress, the 40th anniversary of victory in World War II and the 50th anniversary of the Stakhanov movement in a worthy manner, have taken on the following socialist obligations for 1985:

- achieve one-percent above-plan labor productivity growth and thus ensure a 2.0 million ruble growth in industrial output marketing volume;

- produce 10,000 t of petroleum and 50 million cubic meters of gas above the plan by improving deposit development plans, making extensive use of progressive technology and equipment and accelerating the start-up of capacities. Meet the annual natural gas production and marketing plan by 29 December 1985;

- lower industrial output net cost by 0.5 percent and obtain an above-plan profit of at least 1.0 million rubles in the industry by making better use of material and raw material resources and intensifying economy in all production links;

- in order to ensure overfulfillment of the plan for increasing petroleum and gas reserves, finish construction of one above-plan exploration well;

- drill 1,000 m of rock by improving work organization, strictly following technological procedures and regulations applying to drilling, and introducing highly productive rock-destroying tools and effective chemical reagents;

- systematically improve work on existing wells and re-activate two wells above the plan assignment;

- by improving the operation of gas-lift wells, achieve a one-percent reduction in specific working agent consumption per ton of oil produced;

- switch 10 wells above the assignment over to deep-pump operation;

- achieve improvement in operating conditions at facilities gathering, treating, storing and pumping oil; reduce oil losses to 1.5 percent below the anticipated normatives;

- take 150 geological engineering steps and make 100 tests of wells above the assignment, with a total impact of 50,000 tons of petroleum;

- continue improving secondary and increasing tertiary methods of producing oil. Produce 10,000 tons of oil above the established assignment using these measures;

perform 35 major overhauls and 140 routine repairs above-plan to wells through the use of equipment, technological improvements and improvements in work organization. Reduce average major overhaul and routine repair time by five percent; increase productive maintenance time by five percent;

ensure deliveries of oil to group-I and group-II customers at a 98.0 percent level through quality-improvement measures;

perform 150,000 rubles worth of above-plan construction-installation work and major overhauls on water-development projects by using leading work methods and brigade cost accounting in construction. Complete construction of deep-water stationary platform No 10 of the deposit imeni 28 April;

develop and introduce additional environmental-protection measures and steps to prevent pollution of the Caspian Sea; ensure full utilization of stratal water in oil and gas production administrations; improve the use of existing water conservation facilities; put a 45,000 m<sup>3</sup> sludge dump into operation; increase water recirculation by six million cubic meters;

achieve 10,000 t of above-plan freight shipment by motor transport and 25,000 t by sea through the effective use of motor and sea transport; have the fleet work an additional 5,000 ship-hours;

widely develop socialist competition to increase savings and thrift under the slogan "Work At Least Two Days on Saved Material and Fuel-Energy Resources," using this as a basis for the thrifty use of raw and other materials, fuel and energy. Save 2.0 million kW-hr of electricity, 200,000 t of ferrous metal, 120 tons of gasoline, 700 t of diesel fuel, 2,000 t of boiler and furnace fuel (standard fuel units), 400 Gcal of thermal energy and 32.5 t of lubricants in addition to the assignment;

achieve an economic impact of 4.5 million rubles from introducing efficiency proposals and inventions and 5.0 million rubles from steps involving technical progress as a result of accelerated rates of scientific-technical progress, improved scientific research and development, and broadening of the invention and efficiency-proposal movement;

completely switch over gas-lift oil production ASUTP to microprocessor equipment at the No 2 gas and oil production shop of the p/o imeni 22nd CPSU Congress;

continuously improve ideological-moral education in the labor collectives, reach 24,000 people with economics education, train 1,700 new workers and improve the skills of 7,200 workers;

in accordance with the social development program, ensure the start up of 27,600 m<sup>2</sup> of housing; put an additional 9,500 m<sup>2</sup> of housing into operation; eliminate hazardous housing and move families into well-managed apartments -- at least 2,500 m<sup>2</sup>; plant 5,500 trees and shrubs;

in actualizing the Food Program, market 130 t of meat and 300,000 eggs; put a hog farm for 1,000 head into operation; create a fodder base in Khanlarskiy Rayon;

carry out sanitation-improvement measures and working condition improvement measures totalling at least 3.5 million rubles;

in actualizing the CPSU Central Committee, USSR Council of Ministers and AUCCTU decree on further developing and improving the effectiveness of the brigade form of labor organization and stimulation, cover at least 75 percent of the brigades with this form of labor organization in 1985, ensuring that at least 80 percent of the drilling and rigging-up brigades are working under brigade contracts and at least 50 percent of the brigades in housing construction are working under brigade contracts.

The VPO collective invites the Azneft, Turkmengazprom and Ukrgazprom p/o to join it in socialist competition.

The socialist obligations were discussed and adopted at meetings of collectives of enterprises and organizations of the Kasporneftegazprom VPO.

Minneftekhimprom Azerb. SSR [Azerbaijan SSR Ministry of Petrochemical Industry]

The fourth year of the 11th Five-Year Plan has been successfully concluded by workers in Azerbaijan. The republic has fulfilled and overfulfilled state economic and social development plans and increased socialist obligations each year, increasing social production volumes.

Workers, engineering-technical personnel and employees of enterprises of oil refining and petrochemical industry of the Azerbaijan SSR have made a worthy contribution to the results achieved by the republic.

In actualizing the resolutions of the 26th CPSU Congress and the 30th Congress of the Azerbaijan SSR Communist Party, workers of the Minneftekhimprom Azerb. SSR have directed their efforts at completing the assignments of the 11th Five-Year Plan and the socialist obligations assumed ahead of schedule.

Major successes were achieved in 1985, but even higher frontiers, those set by the 26th Party Congress and subsequent CPSU Central Committee Plenums, must be reached.

The party calls for full use of the enthusiasm of the masses, the inexhaustible wellspring of popular initiative. Taking this powerful factor into account, the CPSU Central Committee supported at the October (1984) Plenum a proposal to set working collectives the specific task of working two days a year on saved raw and other materials and fuel.

Responding to the party's call, branch workers have taken on higher socialist obligations in honor of the 40th anniversary of the victory of the Soviet people over Fascist Germany and the 50th anniversary of the Stakhanov movement and have widely developed socialist competition in honor of the anniversary dates.

These collectives are successfully meeting the higher socialist obligations they took on: Novo-Bakinsk Order of the October Revolution Oil Refinery imeni Vladimir Ilich, Baku Order of Lenin and Order of Labor Red Banner Oil Refinery imeni 22nd CPSU Congress, Baku Order of Labor Red Banner Oil Refinery imeni A. G. Karayev.

The initiators of the socialist competition who carried out the plan for 1984 ahead of schedule included: technological installations Nos 22, 32, 23, 51 NBNZ imeni Vladimir Ilich, 201, 202, 401-402, 406, ELOU-AVT BNZ imeni 22nd CPSU Contrass, Nos 13, 15, 18-19, 21, 26, 41 BNZ imeni A. G. Karayev.

In light of the resolutions of the June (1983) CPSU Central Committee Plenum, which noted that "our society is faced with qualitatively new tasks requiring

mobilization of all the creative potential of the people and a definite re-orienting of social consciousness," branch workers, directing their efforts at further intensifying production, accelerating introduction of the achievements of scientific-technical progress, fighting to save material and labor resources, for high labor productivity and the dissemination of leading production experience, assume the following socialist obligations in the concluding year of the 11th Five-Year Plan:

- meet the annual plan in terms of production by the end of the year and produce 5.2 million rubles worth of above-plan output;

- produce the following above-plan: aviation kerosene -- 15,000 t; diesel fuel -- 20,000 t; oil, road, heavy and liquid [cut-back] asphalts -- 59,000 t; diesel oil for agriculture -- 3,000 t;

- meet the annual contracting work volume plan by 27 December;

- ensure 1.0-percent labor productivity growth as against the established assignment;

- ensure that 46 percent of the total commodity output volume bears the state Badge of Quality;

- achieve above-plan profit totalling 500,000 rubles by saving material expenditures;

- master technology for producing unrefined hard wax at the BNZ imeni 22nd CPSU Congress and produce 12,000 t of it;

- master kerosene mercaptan removal using a domestically-produced catalyst at the NBNZ imeni Vladimir Ilich;

- master butane-butylene fraction hydroisomerization to produce technical-grade isoöctane at the NBNZ imeni Vladimir Ilich;

- ensure a 0.2-percent increase in oil refining depth;

- obtain an economic impact totalling five million rubles from introducing inventions and efficiency proposals;

- achieve an economic impact totalling 2.4 million rubles from introducing new-equipment and scientific labor organization measures;

- certify 500 jobs;

- reduce water consumption by 3.0 percent as against the plan;

- reduce discharges of hazardous substances by five percent as against the plan;

- reduce actual unrecoverable losses of oil and petroleum products by 1,000 tons as against planned norms;

- ensure the release of 1.6 million rubles worth of consumer goods;

- work at least two days on saved material and fuel-energy resources by intensifying saving and using recovered resources in 1985, with the following savings as against approved norms: electricity -- 8.0 million kW-hr; thermal energy -- 50,000 Gcal; fuel -- 27,000 tons of standard fuel; gumbrin -- 10 t; barium hydroxide -- 50 t; methanol -- 15 t; soda ash -- 0.3 t; phenol -- 30 t; benzenesulfinic acid -- 5 t; carbamid -- 2 t;

- improve the skills of 2,400 workers;

- include more than 4,500 people in study in the economics education system and schools of communist labor in the 1984-1985 academic year;

- ensure continued implementation of the USSR Law on Labor Collectives at Enterprises and Organizations in order to reveal reserves for improving labor organization, increasing labor and production discipline, and better enlisting the workers in production management;

- increase the proportion of workers covered by the brigade form of labor organization and stimulation to 60 percent, with 30 percent of the total number of workers on cost accounting;

put 7,820 m of housing into operation;  
reduce working time losses by 10 percent;  
broaden sponsorship ties with kolkhozes and sovkhozes, assisting them in  
the construction of agricultural, personal-services and cultural facilities;  
achieve unconditional fulfillment of the listed labor-protection measures  
plan.

Socialist obligations adopted at a meeting of the party-economic aktiv for  
collectives of workers at enterprises and organizations of the Azerbaijan SSR  
Minneftekhimprom.

#### Azerbaijan State Committee for Gasification [Goskomgaz]

Workers, engineering-technical personnel and employees of the Azerbaijan SSR  
Goskomgaz, in systematically carrying out the tasks put forward by the party  
involving comprehensive improvement in production effectiveness, have actively  
engaged in the nationwide socialist competition for fulfillment of the 11th  
Five-Year Plan ahead of schedule and have achieved definite successes in the  
fourth year of the five-year plan, ensuring uninterrupted gas supplies to con-  
sumers.

In the fourth year of the 11th Five-Year Plan, Azerbaijan SSR Goskomgaz enter-  
prises marked 17.0 billion cubic meters of natural gas and 53,800 tons of com-  
pressed gas, rendering the population 9.08 million rubles worth of personal  
services and supplying 40,500 apartments with gas, including 38,000 apartments  
in rural areas.

105 cities and urban-type settlements and more than 3,500 rural population cen-  
ters are supplied with gas. More than 700 industrial facilities, 13,000 muni-  
cipal, cultural and personal-services institutions, and upwards of 1,600 boil-  
ers use gas as a fuel or raw material.

The number of apartments in the republic hooked up to gas is 1,168,000, includ-  
ing 429,000 in rural areas.

In 1984, some 91.37 percent of the housing was hooked up to gas, including 96.5  
percent of the rural housing and 84.5 percent of the rural housing.

In a shock-work special effort in honor of the 40th anniversary of victory in  
World War II and of the 50th anniversary of the Stakhanov movement, the collec-  
tive of the Azerbaijan SSR Goskomgaz is striving to celebrate the concluding  
year and the 11th Five-Year Plan as a whole with new labor successes.

By perfecting the forms and methods of socialist competition, making creative  
use of the initiatives of production innovators and leading workers, improving  
labor productivity in every way possible, lowering net cost, improving the qua-  
lity of the output being produced and mobilizing all hidden and unused produc-  
tion reserves, workers, engineering-technical personnel and employees of enter-  
prises and organizations of the Azerbaijan SSR Goskomgaz, having studied their  
opportunities, adopt the following socialist obligations for 1985, the fifth  
year of the 11th Five-Year Plan.

#### Basic Activity:

- meet the annual plan for natural gas acceptance and marketing by 28 December 1985 and market an additional 150 million cubic meters of gas;
- meet the annual plan for marketing liquefied gas by 30 December 1985;
- reduce the net cost per 1,000 m<sup>2</sup> of natural gas marketed by 0.2 percent and reduce the net cost per ton of household liquefied gas by one percent, obtaining a savings of 65,000 rubles from the lowered net cost;
- reduce losses of gas in transport by 10 million cubic meters as against the anticipated plan through the introduction of new equipment, intensifying major overhauling of gas mains, efficient detection and elimination of gas leaks, and optimizing gas main operation;
- obtain a 1985 above-plan profit totalling 45,000 rubles by mobilizing additional internal reserves and increasing efforts to economize;
- obtain an economic impact of at least 140,000 rubles by meeting assignments for introducing new equipment and leading experience and by introducing efficiency proposals into production;
- achieve a savings of fuel gas in the republic economy of at least 30,000 rubles by working out and implementing steps to increase the efficiency of gas-burner units;
- improve service quality and efficiency of underground gas main protection in 1985;
- train, retrain and develop second-occupation skills in 200 workers. Improve the skills of 583 engineering-technical personnel and workers. Train 4,000 people in the economics education system.

#### Industry:

- meet the 1985 production volume plan by 28 December 1985 and market an additional 30,000 rubles worth of output;
- produce 60 tons of liquefied gas above-plan in physical terms;
- work systematically to improve product quality;
- save the following by strict and universal economizing: at least 47 tons of standard fuel and 25,000 kW-hr of electricity;
- increase labor productivity by 0.3 percent as against the 1984 level achieved through the efficient use of working time.

#### Construction:

- carry out the contracting plan for the year by 30 December 1985 and do an additional 50,000 rubles worth of work;
- utilize an additional 100,000 rubles in capital investment in Goskomgaz projects;
- raise the level of gasification of republic housing to 91.4 percent by the end of 1985, including 96.6 percent for urban housing and 84.7 percent for rural housing;
- improve construction-installation work quality, ensure that projects are release with ratings of "good" or "excellent";
- provide 32 cities, kolkhozes and sovkhoses with natural gas;
- increase the rates of gasification of rural population centers;
- prepare the cities of Askeran, Kusary, Saatly and more than 25 rural population centers to receive natural gas;
- complete construction of the branch gas line to the cities of Kusary, Imishly and Dashkesan;

ensure the gasification of 38,000 apartments, 32,000 of them in rural areas, including 27,000 with natural gas;  
achieve above-plan labor productivity growth of 1.0 percent;  
exceed the assignment on reducing output net cost by 0.5 percent.

**Personal Services:**

render the populace an additional 10,000 rubles worth of services, including 8,000 rubles in rural areas through the above-plan marketing of 100 tons of liquefied gas;

replace 6,000 household and nonhousehold gas devices to improve municipal and personal services to the populace in 1985.

Socialist obligations discussed in collectives of the enterprises and organizations and adopted at an expanded meeting of the collegium of the Azerbaijan SSR Goskomgaz.

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OIL AND GAS

SYNOPSIS OF ARTICLES IN NEFTYANAYA I GAZOVAYA PROMYSHLENNOST, APRIL-JUNE 1985

Kiev NEFTYANAYA I GAZOVAYA PROMYSHLENNOST in Russian No 2, Apr-Jun 85 pp 56-57

UDC 553.981/.982:550.8(477.5/.5)

PROSPECTING UV [HYDROCARBON] CAKED OIL RESERVOIRS IN THE NORTHWESTERN PORTION OF THE DNEPR-DONETS BASIN (DDV)

[Synopsis of article by B. P. Kabyshev and A. F. Shevchenko, pp 2-5]

[Text] Using the Salogubov structure as an example of an indistinct structural nose within a monoclinial block, the possibility of a new line of prospecting in the northwestern portion of the DDV is substantiated: seeking cake-type oil and gas deposits in Lower Carbonic deposits. The conclusion that cake-type hydrocarbon deposits are present is extended to include the remainder of the DDV, in particular, the so-called open structures in the southeastern portion of the basin. Two illustrations, eight references.

UDC 622.276

EXPERIENCE IN USING EJECTOR PUMPS FOR WELL COMPLETION

[Synopsis of article by B. M. Kifor, Ya. V. Shumskiy and A. M. Gnatyuk, pp 38-39]

[Text] Presents results of the use of ejector devices in completing wells in the "Poltavaneftgaz" NGDU [oil and gas production administration]. Demonstrates that the creation of numerous depressions increases well production rates 1.5- to two-fold and reduces well completion time. Recommends the use of ejector devices in wells whose producing horizons are in hard, stable rock. One illustration.

UDC [553.981.041:551.782.1](477.83+477.86)

GAS PRESENCE OF MIOCENE THRUST-ADJACENT STRUCTURES OF THE PRECARPATHIAN TROUGH

[Synopsis of article by A. S. Pilipchuk and Yu. R. Karpenchuk, pp 5-6]

[Text] A network of promising structures formed by allochthonous thrust masses, a majority of which are commercially exploitable, has been discovered in the



autochthonous Baden-Sarmatsk deposits of the Bilchye-Volitsk zone of the pre-Carpathian trough in a band adjacent to the Samborsk thrust nappe. Parametric drilling and exploration geophysical work to reveal new structures of this type is recommended. One illustration.

UDC 550.832

#### POSITION OF CLAY ROCK NORMAL COMPACTION LINE

[Synopsis of article by Yu. S. Starostin, pp 20-22]

[Text] Demonstrates the necessity of recording changes in the mineralization of bed water and the lithologic features of the rock when constructing a normal compaction line for clay rock to enable more-reliable disclosure of the AVPD [anomalously high formational pressure] zone and better calculation of the pore pressure using geophysical methods. One illustration, four references.

UDC 553.98(477.4/5)

#### DEPENDENCE OF SUCCESSFUL PROSPECTING OF DDV DEPOSITS ON STRUCTURE SIZE

[Synopsis of article by O. A. Parkhomovskiy and T. B. Kuznetsova, pp 9-11]

[Text] Demonstrates the dependence of success in prospecting deposits of varying size on the size of the prepared structures in which exploration drilling is being started, which is of importance when planning an increment in explored petroleum and gas reserves. Three tables.

UDC 551.243(477.4/6)

#### EXPERIENCE IN PREDICTING UV [HYDROCARBON] DEPOSITS BASED ON AEROMAGNETIC SURVEY DATA

[Synopsis of article by V. D. Kharitonov, pp 16-20]

[Text] Presents the results of visual analysis of aeromagnetic data from an area of the southern monoclinal slope of the DDV, together with gravity prospecting, electric prospecting and other geological-geophysical data. Establishes a strong correlation between the typical local anomalies  $\Delta T_a$  and the column of oil. Confirms the presence of relative local  $\Delta T_a$  lows above known UV deposits. Demonstrates that use of the collected geological-geophysical data when visually analyzing the  $\Delta T_a$  field permits classifying local  $\Delta T_a$  lows by degree of promise and noting anomalous magnetic field sectors which are of prospecting interest with regard to oil and gas presence. Four illustrations, six references.

UDC 553.98:552.082

#### EFFECT OF LITHOLOGIC FEATURES ON THE STRUCTURE OF ROCK PORE SPACE

[Synopsis of article by G. Il Antonishin, T. V. Budzenko and O. M. Gunevskaya, pp 7-9]

[Text] Gives the results of a study of the lithologic features, pore space structure and reservoir properties of deep rock of the Turneysk stage of the Yablunovsk deposit of the Dnepr-Donetsk Basin. Establishes the factors facilitating the retention of high-quality reservoirs at great depths. Two tables, two references.

UDC 550.832:519.2

#### EVALUATING THE INFORMATIVENESS OF GIS [not further identified] METHODS IN DELINEATING RESERVOIRS

[Synopsis of article by V. I. Yemelyanov, Ye. I. Kaplan and L. V. Bykhova, pp 13-16]

[Text] Using the Namyursk deposits of the Kotelevsk area of the DDV, describes methods of evaluating the informativeness of geophysical parameters in delineating reservoirs using reference data. Demonstrates the possibility of reducing the number of parameters used and determining optimum GIS methods packages when solving the indicated problem. Four illustrations, four references.

UDC 622.244.6

#### INFLUENCE OF FORMATION EXPOSING CONDITIONS ON WELL COMPLETION

[Synopsis of article by D. A. Yeger and Ye. V. Rybchak, pp 28-30]

[Text] Brief analysis of the effect of formation exposing conditions on well completion results. Demonstrates, using field data analysis, that hydroabrasive perforation is technologically the most effective means of exposing producing formations at great depths. Two tables, two references.

UDC 665.637.6:665.3.062.818.2

#### INCREASING REFINED PETROLEUM YIELDS AT INSTALLATIONS CLEANING OIL WITH FURFURAL

[Synopsis of article by V. T. Grushchak, Ye. A. Litkovets and G. S. Kalenik, pp 52-54]

[Text] Results of a chromatographic determination of the group hydrocarbon composition of extracts of fractions cleaned using furfural at 350-420 and 420-500°C and of the corresponding recycle stocks. Two illustrations, two tables, six references.

UDC 622.692.4.07

#### ANALYTICAL METHOD OF DETERMINING GAS PIPELINE THROUGHPUT

[Synopsis of article by V. N. Novakovskiy, pp 44-45]

[Text] Proposes an approximate analytical method of determining the optimum throughput of gas mains, for use as an express method for determining the distance between compressor stations. Special nomogram. One illustration.

## ITS-1 INDICATOR FOR MONITORING PREFLUSH CIRCULATION

[Synopsis of article by N. I. Degtev, A. I. Zinkevich and O. K. Zapatrina, pp 24-25]

[Text] Describes design and operation of the ITS-1 indicator used to monitor the circulation of drilling preflush. The results of test-flush operation of the indicator permit the conclusion its extensive use in well drilling is appropriate and will enable one to avoid a number of complications associated with preflush gas shows and intakes. One illustration.

UDC [622.279+622.276](1-04)

## CALCULATING LIQUID UV SOLVENT PLUG PROCESS INDICATORS

[Synopsis of article by S. N. Buzinov, V. G. Sarkisov and L. A. Rozhibayeva, pp 32-34]

[Text] Offers methods of calculating the technological indicators of liquid hydrocarbon (petroleum and condensate) solvent plug process moving along a formation by residue gas; involves use of a heterogeneous-layer formation calculation model. Method permits determining the recovery ratio, required amounts of solvent plug and residual gas, as well as amount of solvent recoverable. Two illustrations.

UDC 622.276:541.182.43

## INFLUENCE OF PHASE DISPLACEMENT VOLUME ON PROPERTIES OF INVERT EMULSIONS

[Synopsis of article by V. N. Glushchenko, M. Sh. Kendis and G. A. Orlov, pp 35-38]

[Text] Research established that lowering the volumetric water content of invert emulsions increases their stability relative to coagulation and coalescence and improves technological properties when they are used as killing liquids at oil wells. A mechanical device was developed to clean NKT [not further identified] and electric cables of the killing liquid, improving working conditions and avoiding contamination of the environment. Three illustrations, three tables.

UDC 621.872

## FEATURES OF PIPELINE OPERATION UNDER SUPERCRITICAL PRESSURE

[Synopsis of article by A. A. Sverdlov, A. I. Valeyeva and V. I. Mogilnyy, pp 40-43]

[Text] Gives research results for emptying and filling pipeline sections operating under supercritical pressure. Describes the technology involved; gives some results in graphs. Three illustrations, three references.

## FORECASTING PARAMETERS OF UNTREATED DRILLING MUD

[Synopsis of article by L. I. Dopilko, V. I. Neudachina and T. I. Tripolskaya, pp 23-24]

[Text] Detailed laboratory research of grade-II Sarygyukhsk bentonite provided mainly by the "Ukrneft" PO drilling enterprises provided an opportunity to determine the dependence of the basic parameters of the mud on the gel powder content (5-20 percent). A nomogram was constructed based on the results obtained, permitting a forecast of the density values, specific viscosity, gel strength and filtration as a function of gel powder concentration. A nomogram was also constructed to determine the amount of gel powder to prepare a preset volume of mud. Table of specific viscosity reduction and gel strength factors as a function of amount of graphite additive. Two illustrations, one table.

UDC 662.959

## OPTIMIZING GAS FLOW RATE MEASUREMENT RESULTS PROCESSING

[Synopsis of article by A. F. Frolov and V. I. Bilous, pp 43-44]

[Text] Describes ways of representing adjustment factors  $\epsilon$  and  $\Delta K$ , components of the formula for estimating daily gas flow rate, in tabular form which were introduced in the "Kiyevtransgaz" PO. Substantiates a form of representing calculation coefficient  $k_{re}$  which is easy to use and quite precise. Defines ways of improving the system for recording gas flow rate using computers and automatic instrumentation. Two tables.

UDC 622.276.8

## SHAPE OF SEPARATOR DEFOAMING SECTION CHANNELS

[Synopsis of article by V. P. Tronov, A. V. Tronov and A. I. Shireyev, pp 30-32]

[Text] Examines various shapes of separator channel defoaming cells designed to treat high-foam oil and evaluates their effectiveness given various foam gas contents. Demonstrates the good effectiveness of triangular-section, base-up cells when foam gas content is low and of rectangular-section cells for any gas content.

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NUCLEAR POWER

NOVOVORONEZH AST DIRECTOR ASSURES POPULATION OF SAFETY

Moscow SOVETSKAYA ROSSIYA in Russian 21 Nov 85 p 1

[Article by SOVETSKAYA ROSSIYA correspondent A. Pyatunin, Voronezh: "The Heat of the Peaceful Atom: A Topical Report"]

[Text] No one is surprised these days that the peaceful atom bears its proper share of labor in the most varied spheres of life. It founds steel, moves trains, illuminates streets and homes and even milks cows. But soon, another important function will be added to its "duties." It will supply hot water to our apartments and heat them with its own warmth. And we were convinced that that time is not far off when visiting the Voronezh Nuclear Heating Plant (ATS), the first in the country.

We spoke with Plant Director I. Prokopenko, who recently took over the job. Before that he worked for many years at the Novovoronezh AES, and recently helped our Hungarian colleagues to start up the Paksh Nuclear Plant. Ivan Vasilyevich emphasized the great technical and economic significance of the use of "nuclear" heat in the economy.

What constitutes the new plant and what are the principles of its operation?

"Our plant is substantially different from nuclear power plants currently operating. That includes the nearby Novovoronezh AES," said I. Prokopenko. "They have a different purpose. They are called upon to produce light and electricity, but we--heat."

"The last units of the Novovoronezh AES, as is well known, became pilot models for many analogous nuclear plants. Our plant should also become such a pilot model for a new family of 'nuclear boilers' in the near future."

The director answered convincingly a question that especially concerned the city's residents: how safe for everyday use is the hot water that comes into their apartments from nuclear reactors? There turns out to be no cause for alarm. Water is collected into the first closed loop from the Den River, passes through necessary treatment and is used right there. The second loop is also closed. Water from it, passing through a steam generator, transfers heat to the third loop, with a water temperature of up to 150 degrees. And only this water, diluted at city heat and electric power plants to the necessary

temperature, goes out to consumers. There can be no talk here of any radio-activity in this.

To conclude matters at the construction site. They started up, for all practical purposes, two years ago. Since then, a concrete mortar center, a number of storage platforms and structures, a boiler, electrical and water supply lines, motor vehicle access roads, railroad spur lines and other projects in the construction base have been placed in operation. The bedplate and protective enclosure have been finished in the main part of the first reactor section complex. The construction of the reactor well has begun... Social and cultural construction projects are being erected at the same time as work in the industrial zone: a dining hall, living area complex and an administrative building. There are 24,000 square meters of living space in the workers' town of Shilovo, and self-service department stores and nursery schools are being built.

The plant is still in construction scaffolding, but two heating lines already stretch from it to the oblast center.

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NUCLEAR POWER

REPORT ON PROGRESS OF ROSTOVSKAYA AES CONSTRUCTION

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 18 Oct 85 p 1

[Article by L. Shamardina: "The Contract Brought Changes"]

[Text] Volgodonsk--We met P. Molchanov, construction superintendent of Atomenergostroy, below, at the entrance to the first reactor unit.

"Technical supervision is already there," said N. Boyko, sector chief of Gidromontazh, with a nod upwards, where a crane was delivering a bulky metal structure with an unusual triangular shape.

"That is the final element of the covering. So we were on schedule," reported Nikolay Vasilyevich to his subcontractor.

Molchanov began to hurry. And Boyko neatly circled another figure on the sheet with the schematic targets for October--finished. I noticed that only one line out of six was not yet marked off as being fulfilled. I make a supposition:

"Only the first 10 days of the month have passed but essentially the plan has already been fulfilled?"

"Quite a bit of work has to be done to fulfill the entire planned volume. But the main thing has already been done: we have provided the concrete workers with a work front," explained Nikolay Vasilyevich. "After all, we are now working entirely under contract. We are even planning differently, not in tons, as before, but in cubic meters."

Here an explanation is needed. The concrete workers of Atomenergostroy--the brigade of A. Gorbachev--and the assemblers of Gidromontazh work side by side. But until recently all of the work of the assembly brigades was measured in tons of metal structures, which were installed with no particular consideration for the interests of the subcontractor. But the concrete workers needed vats of three-dimensional structures--"vessels", as they say at the construction project--which can be filled with concrete. And not just anywhere but strictly in accordance with construction technology. There was no coordination as long as the partners had two separate plans and there were two means of payment--some by the ton and some by the cubic meter.

The "working relay" that was considered to be operating in the construction of the reactor essentially had no basis or organizational foundation. They competed for one thing and were paid for another. That is why the conference to tally the 10-day results turned into a dispute about who let whom down and when.

At no time during a year and a half were the assembly brigades noted as winners in the relay. But the lag in the material position of the brigades did not show at all. In short, such competition did not mean much to the competitors and the work suffered. The reactor unit grew slowly.

One of the brigade leaders wrote about this back in July in the pages of SOTSIALISTICHESKAYA INDUSTRIYA. In his statement, M. Dyakov quite rightly raised the question: "What is the value of A. Gorbachev's contract without mine?" Afterwards there was a meeting of the party committee of the construction project, and then there was a general meeting of the subcontractors.

As early as August, the first month of the work under the agreement for a general integral contract, the concrete workers overfulfilled the monthly target. Last month, A. Gorbachev's brigade again achieved 102 percent. And structures clad in concrete are in fact finished products, a final and visible result. The unified contract fundamentally changed the relationship of the assemblers to the "working relay." For four consecutive 10-day periods, the youth brigade of S. Iskortsev was second to none in this competition.

"The score is in our favor," stressed section chief N. Boyko.

It is not surprising. The monthly output per worker in this collective is 1,800 rubles instead of the 1,400 under the plan. And each ruble works for the subcontractor and thereby for the overall result. At the same time, the brigade of S. Iskortsev has performed its work reliably from the outset.

"The main thing," thinks brigade leader M. Dyakov, "is that we were finally able to separate ourselves from the concrete workers. They are not on our heels now and we do not hinder them. They are already in full control on the 13th."

The reactor unit is growing by story elevations. 13.2 meters above the ground is not a great height but a very special one. Here is the boundary: everything below it is still the auxiliary part of the service. But above it begins the sealed area, technically the most complex. Its foundation is a thick slab in which, as determined by the builders, there is more metal than concrete. The assemblers finished their part and went two stages higher. They are now working at the 16 and 19-meter levels.

Working in three shifts are not only Iskortsev and his comrades but also the chemical protection brigades. Any day now, they will begin the assembly of the containment, the main event of the year at the construction site of Rostovskaya Nuclear Power Plant.

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NUCLEAR POWER

REPORT ON PROGRESS OF IGNALINSKAYA AES CONSTRUCTION

Vilnius SOVETSKAYA LITVA in Russian 17 Dec 85 p 1

[Article by A. Poletayeva, editor of the large-circulation newspaper ENERGETIK, "Second Power Block Is Growing"; first paragraph is SOVETSKAYA LITVA introduction]

[Excerpts] The collective of the Western Administration for construction is preparing for a worthy celebration of the 27th CPSU Congress. The plan of the 11th Five-Year Plan for the general contract was fulfilled on 26 September, and the plan for construction and installation work through own forces was fulfilled even earlier--on 10 September. And what is the collective of builders of the Ignalinskaya AES [Nuclear Power Plant] doing at the end of the final year of the five-year plan?

Thousands of builders and assemblers of Ignalinskaya AES are now concentrating their efforts prior to the year of the start-up. Mid-1986 is the time for the start-up of the station's second power unit. And the closer this critical period approaches, the more valuable each day and each hour of working time becomes.

The total amount of work that has been performed by builders and that still must be done simply boggles the mind. The collectives of construction and installation administrations Nos 8 and 32 and of other organizations successfully handled the reception of voltage for the station's own needs, which made it possible to put into operation many pumps and other mechanisms, without which it is not possible to begin the subsequent stages of the work.

As always, particular attention is paid to the events in unit "A," where the reactor, the heart of the power plant, is located. While the brigades of A. Ponomarev and I. Aleynikov from Construction and Installation Administration No 1--well-known in construction--and other collectives prepared a work front for the assembly of the reactor in the shaft, the fitters and assemblers brigade of N. Turnayev worked to enlarge it. The reactor circuits were assembled in record time.

And still another noteworthy event took place in unit "A." A complex of work was completed in the central hall, which made it possible to begin the

assembly of the channels of the reactor. All of the essential work here was completed a year earlier than in the construction of the first unit.

Brigade leaders Yu. Shirko, Yu. Polyayev, N. Turnayev and G. Boldakov installed the first of almost 1,890 channels. The assemblers and operators will continue this very delicate work for a number of months yet. The installation of a huge three-barreled ventilation pipe will also soon begin. The builders of construction and installation administrations Nos 1 and 10 are promising to turn over to the "maryasovtsy" a work front for assembly almost a month ahead of schedule.

The builders of Installation and Procurement Administration No 12 are also preparing a work front for the assembly brigades at turbogenerator No 3.

"Delivered ready for assembly": today these words can be heard in construction more often than others. They characterize the current stage of the construction of the second power unit.

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7 March 1986

# REPORT ON PROGRESS OF SMOLENSKAYA AES CONSTRUCTION

Moscow SELSKAYA ZHIZN in Russian 22 Dec 85 pp 1, 4

[Article by L. Kruglov: "The Light of the Peaceful Atom"]

[Excerpts] Smolensk Oblast--Outside the bus window are white fields and groves. The new "Ikarus" is hurrying to Desnogorsk, to the Smolenskaya Nuclear Power Station. The trademark of the installation, "RBMK," is deciphered extremely simply: "high-power boiling water reactor."

"In essence, this is a boiler made out of graphite 'bricks'," explains Anatoliy Vasilyevich, "two thousand tons of completely ordinary graphite, the stuff of which pencils are made. Hundreds of narrow channels have been made in the body of the reactor. Fuel elements--rods filled with U-238 and U-235--have been inserted into them. Over there, in the corner, do you see the 'sausages' several meters long in polyethylene sheaths? They are awaiting their turn."

"And what about the radiation," I blurt out involuntarily.

"The natural background radiation of uranium has no effect on health," calmly explains Vladimir Alekseyevich Popelkov, head of the shift of the section for radiation safety; "after all, uranium exists in nature! You can walk up and touch it. It is another matter when a chain reaction is taking place. At the plant, we have ensured vigorous biological protection and provided for reliable radiation monitoring of gamma rays and various products in the decay of uranium. Several hundred sensors indicating any change in the level of radiation have been set up in the rooms of the plant."

"Well, what happens when it comes time to throw some 'wood' into the furnace? Here, obviously, dangerous contact cannot be avoided?" I ask.

"And what is that for?" asks Anatoliy Vasilyevich, nodding in the direction of a massive blue column that rose from the floor to the ceiling. "We use a special robot to load and unload fuel. The central rods burn out more rapidly than those located on the periphery of the 'boiler'. They periodically shuffle them or install new ones."

After climbing a few flights of a steep metallic gangway, we are at the robot control panel. There are thick concrete walls, a porthole with a smokey lead pane, a panel with manipulators, and external television cameras.

"We transfer the fuel elements without shutting the reactor down," relates Vladimir Modestovich Ivanov, senior operator in the reactor section. "We usually do this at night, when there are not so many people at the plant. In principle, however, it can be done any time, even right now. The biological protection at the plant is reliable."

Slowly, meter by meter, the switched-on television cameras probe the entire room. The steel colossus can stop at any point in the room, aim the mouth of its "cannon" at the appropriate channel, open it, pull in the rod being replaced, and put another one in its place. For a second, one could see the wondrous machine at work. It was as if one of the columns of the Bolshoy Theater decided to "take a stroll" around the square. The weight and dimensions were about the same.

Passing through a labyrinth of corridors, we come to the "nerve center," the block control panel of the AES [nuclear power plant]. It is a horseshoe-shaped console with numerous buttons and flashing displays of various colors. On the wall, with a greenish scintillation, is the mnemonic control panel for the work of the reactor. At any instant it indicates how the reaction is proceeding. From here they control all of the technological processes of the power block. Calmly, without fuss or hurry, the physicists and thermal power engineers keep watch.

"If you look from afar, it appears that the people are not doing anything, everything being automated," slyly says Dmitriy Denisovich Krivoy, head of the station shift. "But that is only the first impression. There are times when in a matter of seconds one has to make the only correct decision, showing coolness and self-control, so as not to violate the technological process of the entire complex. This takes experience and knowledge."

The endless span of the turbine section. Floor of white plastic. Not a soul. The power units hum smoothly. On each of them is the mark of the renowned Leningrad enterprise: "Electric Power imeni S.M. Kirov. Three-phase Turbogenerator. 1982." The power plants were manufactured at the Kharkov Turbine Plant. The steam generated in the reactor hits the vanes of the turbine with terrific force, causing them to rotate at a speed of 3,000 revolutions per minute! In the glass-enclosed room similar to a pilot's cockpit, there is only one person on duty--steam turbine operator Nikolay Anatolyevich Dementyev, a power engineer with 20 years' experience who came from Siberia to work at the Smolenskaya AES.

"The station's first unit--two turbogenerators each having a capacity of 500,000 kilowatts--was commissioned in December 1982," he relates. "The second, which is similar to it, was switched on ahead of schedule for the 40th anniversary of Victory. In 24 hours, one unit produces 24 million kilowatt-hours of electric power, which we feed into the country's Unified Power System. Those wires over there lead to the substation," explains Nikolay

Anatolyevich as he smooths down his gray hairs. "Here I am considered a veteran. In general, our Desnogorsk is a youthful city...."

"Indeed, the average age of the workers at our plant is 27," tells Yuriy Vasilyevich Svinin, heat engineer and secretary of the party committee of the Smolenskaya AES. "The people are establishing families and 350,000 square meters of housing have been rented. And we will continue the construction in the next five-year plan. We are building schools, kindergardens, stores, a House of Family Life, a bathhouse and a sports complex."

The second phase of the plant will begin full operation in 1989 and the third in 1993. That is four more units. And then, going into the 21st century, the plant capacity will reach 6 million kilowatts, equalling the Krasnoyarskaya GES [Hydroelectric Power Station]

Nuclear power plants built according to Soviet plans and with Soviet equipment are operating in our country and in Bulgaria, Hungary, the GDR and the CSSR and are being built in Cuba, Poland and Romania.

The preference for nuclear power is commanded by our time and is not a fad. In the Great Soviet Encyclopedia, we read: "In the fission of 1 gram of uranium or plutonium isotopes, 22,500 kilowatt-hours are released, which is equivalent to the energy contained in 2,800 kilograms of standard fuel."

It is not difficult to calculate that in 24 hours just one unit of the Smolenskaya AES saves 3,000 tons of coal. A stream of energy generated in the very center of the country is flowing into the country's mighty ocean of electric power. The Smolensk AES is just gaining strength. And its light, generated by the peaceful atom, will be the most natural light for those living in the next millenium.

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## NUCLEAR POWER

### NEW CONSTRUCTION TECHNIQUES USED AT BALAKOVSKAYA AES

Moscow PRAVDA in Russian 29 Nov 85 p 1

[Interview with A. I. Maksakov, chief of the Saratovgesstroy [Saratov Hydroelectric Construction Administration] by PRAVDA correspondent A. Vorotnikov: "The First Unit!: The Balakovo Nuclear Plant Enters the Ranks"]

[Text] The once-quiet Volga town of Balakovo has now been unrecognizably transformed. Major enterprises have arisen here in the chemical, construction and energy industries over a short period. The Saratov Hydroelectric Plant has long produced power. And now the first million-kilowatt unit at the Balakovo Nuclear Plant is entering the ranks. How did its construction go? The chief of Saratovgesstroy, A. I. Maksakov, replies to that question of PRAVDA correspondent A. Vorotnikov.

"Every builder," he said, "is especially happy at the moment when the project is accepted by the state commission. The first 'millionaire' unit of the Balakovo Nuclear Plant is ready for inclusion in the country's Unified Energy System. Five years ago, the first cubic meter of concrete was poured in the plant foundation, and in December of this year the first electricity will be produced.

"How did it begin in 1980? First, motor vehicle and railroad access routes, water and gas lines, electricity and other service lines were put in that were essential for the normal operation of construction and the plant. At the site itself, underground service lines were installed in a short time as well as yards for the larger assembly of structures and equipment. Everyday issues were also resolved at the same time--dining halls and stores appeared and the transport of people on a new trolley line was set up. All of this was done before the beginning of work on the basic projects. That laid the basis for good working conditions on the site. All support projects were fully completed and placed in operation a year before the introduction of the 'millionaire.'"

[Question] "What innovations were used in erecting the AES?"

[Answer] "All workers, technicians and engineers completed courses to raise their skills in the course of project construction. This practice has paid off in full: the concrete-pouring units and the powerful lifting equipment

operate precisely and without interruption. Progressive technology makes this possible. In the first place, this is an assembly of enlarged units. That greatly reduced erection times for the main plant projects--the reactor section and the engine room. With this the quality of work is much higher: after all, the basic assembly is carried out in a yard, almost under factory conditions. Of 64 projects, 58 were accepted with "excellent" ratings, and just 6 with "good." The collectives of the Volgoenergomontazh [the Volga Electrical Assembly Trust], the Volga section of Gidromontazh [Hydroassembly] and other organizations of the USSR Ministry of Assembly and Special Construction Operations made their own contributions to this.

"Experience accumulated on the first unit, multiplied by increased professional training, will permit the construction of 4 power-generating units in the next five-year plan. Major-unit assembly with the simultaneous installation of heavy plant equipment will be even more widely applied. In this way, the productivity of labor can be raised and work times can be reduced.

"The annual amount of work on the construction of the Balakovo AES will grow to 100-120 million rubles. We are already preparing for this today: the routine renovation of the industrial base after construction is underway. We have good design documentation and highly-skilled personnel at our disposal. And this is the true guarantee that the engineers will fulfill the projection with honor."

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## NUCLEAR POWER

### BRIEFS

**ENGINEERS FOR BALAKOVO AES**--Balakovo (Saratov Oblast), 17 Nov--The local branch of the Saratov Polytechnical Institute has begun for the first time to train personnel for nuclear power plant construction. Students studying in the Industrial and Civil Construction Department will now have the opportunity to specialize in metal structures and AES construction. The birth of the new specialization was caused by the great needs of the growing Volga city. The first AES of the Volga region will be erected here. [By PRAVDA correspondent A. Vorotnikov] [Text] [Moscow PRAVDA in Russian 18 Nov 85 p 1] 12821

**UNIT STARTUP AT KURSK**--At the Kursk AES, the electrical startup of the fourth power-generating unit was carried out. The count began of electricity entering the country's unified electrical system. More than 113 billion kilowatt-hours have been produced by the three operating units. ...Construction of the Kursk Nuclear Plant began in December of 1970. And where its first unit was built over six years, the later ones were done twice as fast. The acceleration was achieved first and foremost by the industrialization of the construction and assembly work and the introduction of progressive technology. Thus, in the erection of the fourth unit, the enlargement of structures provided the greatest efficiency. For the first time, the face of the central room of the reactor section was closed with assembly elements weighing up to 40 tons. Thanks to this, the construction and assembly times were reduced by one and a half to two times and labor expenditures decreased. Competition on the "workers' relay" principle also had a positive effect on unit construction. In this year alone, 177 contract teams completed almost 40 million rubles of work. And, by way of illustration, a total of more than 160,000 cubic meters of concrete and ferro-concrete were poured, 1,860 kilometers of cable were laid and approximately 35,000 tons of equipment was assembled. [By KURSKAYA PRAVDA correspondent V. Malafayev] [Excerpts] [Moscow PRAVDA in Russian 7 Dec 85 p 1] 12821

**SECOND UNIT AT ZAPOROZHYE**--Thanks to a continuous-flow technique, the construction of the Zaporozhye Nuclear Power Plant is accelerating. The second of its power-generating units, with a million kilowatts of power, was placed into operation the other day. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian, No 47, Nov 85 p 3] 12821

**SMOLENSK AES UNDER CONSTRUCTION**--The scope of the work at the Smolensk AES construction staggers the imagination. Approximately a billion rubles of



capital investment have already been assimilated here, including more than 50 million rubles over the first ten months of this year alone. The first unit of the second phase is now being built at a rapid pace and is projected to be entered into operation in 1987. At the same time, great residential construction is underway in the nuclear construction workers' town of Desnogorsk. [Excerpts] [Moscow IZVESTIYA in Russian 2 Dec 85 p 1] 12821

REACTOR'S ICE ODYSSEY--Dzerzhinsk, Gorkiy Oblast (TASS)--The ice portion of the transport operation to deliver the reactor of the first nuclear heating plant has been completed. It was the first time in national history that such a crucial cargo was transferred by water in winter to the assembly location. The transshipment of the 200-ton reactor housing to other means of transport was begun in the port of the Dzerzhinsk Chemical Machine-Building Plant where the steamship Volga-Don-143 had arrived. The reactor housing will now be shipped from Dzerzhinsk on a special barge, and then powerful tractors will deliver it to the assembly location at the plant. [Excerpts] [Moscow IZVESTIYA in Russian 18 Dec 85 p 1] 12821

NOVOSIBIRSK PLANT FILLS ORDER--Novosibirsk--The output of the Novosibirsk plant "Tyazhstankogidropress" enjoys a good reputation in many of the country's industrial centers, including at the plant for nuclear power machine building in the city of Volgodonsk in Rostov Oblast. By order of "Atommash," the people in Novosibirsk manufactured a unique longitudinal machine tool equipped with special attachments for the performance of milling and planing operations. [By P. Chernov] [Text] [Moscow SELSKAYA ZHIZN in Russian 7 Dec 85 p 1] 9746

REACTOR TRANSPORT FEAT--Dzerzhinsk (Gorkiy Oblast) (TASS)--The icy part of a unique transport operation to deliver the reactor of the first heat-supply plant has been completed. The huge apparatus, manufactured by the collective of the "Atommash" plant in Volgodonsk, was transported by water to the assembly site. The diesel boat "Volga-Don 143" with the reactor on board broke through to the port of the Dzerzhinsk plant for chemical machine building, where it began to be transhipped for delivery to the site of the station under construction in Gorkiy. It took the river transport workers 9 days to move the 200-ton load on the Volga-Don Canal and the frozen Volga. Specialists consider the unique transport operation to deliver the reactor vessel from Volgodonsk, especially its icy part on the frozen Volga, to be a labor feat. [Text] [Moscow SELSKAYA ZHIZN in Russian 18 Dec 85 p 1] 9746

KALININSKAYA AES--Udomlya, Kalinin Oblast--The administration of Gidromontazh of the Ministry of Power and Electrification, working on the construction of the Kalinskaya Nuclear Electric Power Plant [KAES], assimilated more than 75,000 rubles above the five-year plan. This is one of the main assembly organizations working on the construction of the body of the reactor section and other vital sectors of the second KAES power unit, the start-up of which is supposed to take place the middle of next year. [By V. Ovchinnikov] [Excerpts] [Moscow STROITELNAYA GAZETA in Russian 27 Nov 85 p 1] 9746

CSO: 1822/139

## NON-NUCLEAR POWER

### VALUE OF COMPLETING POWER TRANSMISSION LINE DEBATED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Jan 86 p 2

[Article by A. Valentinov: "A Billion in Dispute"]

[Text] "Continue forming the country's unified power system, build inter-system power transmission lines carrying 500, 750 and 1,150 kilovolts of alternating current and 1,500 kilovolts of direct current..."--so it is written in the draft Basic Directions. The USSR Gosstroy proposed dropping the direct-current 1,500 kilovolt line--the LEP-1500--from this item. The power facility financing administration of the USSR Stroyban supported this proposal.

You must agree that it would take very substantial arguments to turn away from such an important facility. And Gosstroy did present such arguments. Around 15 years ago a clear imbalance was taking shape on the country's power supply map. Construction of four high-capacity thermal electric power plants, planned in the vicinity of Ekibastuz, was to create a tangible energy surplus in this area. At the same time there was going to be a shortage of electric power in the European part of the country. It was then that the Ekibastuz-Center power supply bridge was conceived. It was to be 2,414 kilometers long, and it was to be built at a total estimated cost of around 1 billion rubles. This bridge would be able to "pump" surplus electric power from northern Kazakhstan into the European part of the country. It was precisely this trunkline, construction of which had already begun, that Gosstroy felt it necessary to mothball.

"The problem is not at all that this power line elicited debate among specialists from the very beginning," it was explained to me by G. Chegasov, deputy chief of the power engineering and heat supply department of the USSR Gosstroy's Glavgosekspertiza [not further identified]. "The simple truth of the matter is that the situation changed fundamentally in the course of its erection."

Because the USSR Ministry of Power and Electrification built only one of the four Ekibastuz state regional electric power plants and because several nuclear power plants were placed into operation in the European part of the country, the imbalance on the power supply map turned completely the other way.

"Now there is a shortage of electric power in Ekibastuz, and according to the predictions it will not be surmounted for another 10 years," continued G. Chegasov. "But even then a consumer of the Ekibastuz surplus could be found: Central Asia, where according to the same predictions the energy shortage will grow up to the year 2000. Such that there would be nothing to transfer to the European part of the country. And why should anything be transferred? There is a surplus of output capacities there. And although the Center is already transferring surplus power to the Urals, nonetheless the Kolskaya and Leningradskaya AES must be periodically "plugged up" because there is no place to move their products. Though on second thought there is a place: The Ukraine and the northern Caucasus--the sole regions in the European part of the country where energy is lacking. But the Ministry of Power and Electrification has still not built the "bridges"--the short power transmission lines that would make it possible to maneuver energy between regions. And it explains this by a shortage of steel-aluminum cable, of metallic structures for the supports and of capital investments, which are needed by other lines, including the LEP-1500. I feel that erection of this line must be abandoned in the 12th Five-Year Plan. It would be more suitable to lengthen as far as the Center the 1,150 kilovolt alternating current line that extends through Ekibastuz to the Urals; this line is also itemized in the draft Basic Directions. Not only will it solve the problem of transferring large flows of power, if they come into being, but it will also make it possible to create high-power intersystem bridges between the Center, the Volga, the Urals and northern Kazakhstan by as early as 1990."

This is the idea that USSR Gosstroy proposed. As with any idea, it must have its proponents and opponents. I thought it might be interesting to learn the opinion of the organizations upon which resolution of this issue would depend. And I found that there are no proponents--all specialists are categorically against the idea, and they demand that the billion rubles be spent as originally intended.

"Paradoxical though this may sound, we would have to say it was fortunate that the USSR Ministry of Power and Electrification took so long to build this line," said V. Yershevich, assistant to the chief engineer of the Energosetproyekt Institute. Yershevich is responsible for the problems of long-range development of power supply systems. "Otherwise we would have been in a fix--the line is designed to transmit energy in only one direction, and there is nothing to transmit. But now because of the postponements we were able to turn all of the apparatus around: Now we can pump energy in both directions."

"Why in both directions when it is clear that energy will not flow from Ekibastuz to the Center?"

"We changed the purpose of the line: It is now intended not to transport power but to maneuver it. The possibility for freely maneuvering energy over the vast expanses of our country is a great problem. Of course, the one LEP-1500 is not enough for this. We also need to build a line between Barnaul and Itat. This line is to go into operation in 1990. After that, we would be able to combine all of the energy of the nuclear power plants

of the European part of the country and the gigantic hydroelectric power plants of East Siberia into a single controllable flow."

Yershevich explained the problem quite clearly. And from this point of view there can be no doubt as to the need for the LEP-1500. Other arguments were presented by V. Dobrokhoto, chief of the power and electrical engineering department of the State Committee for Science and Technology.

"Transfer of electric power over large distances has now grown into a priority problem," said Viktor Ivanovich. "But there are still many obstacles to solving this problem. The only solution is to build ultralong direct current power transmission lines. There are no such lines in the world as yet. Not even in our country. All we have are the two short Kashira-Moscow and Volgograd-Donets Basin trunklines, which are so obsolete that it makes me uncomfortable even to talk about them. The LEP-1500 we are talking about is being designed on the basis of fundamentally new concepts. We have already spent 200 billion rubles on developing these concepts and creating the equipment."

"In other words you consider this to be an experimental line intended to test these scientific concepts?"

"Quite right. In addition to its primary purpose, it will also serve as a trampoline for future power mains. For example science has forwarded the idea of creating a 2,500 kilovolt direct current line extending from the Kansk-Achinsk power production complex to the Urals and Europe. No one in the world has yet even entertained such an idea. The LEP-1500 will help scientists solve many problems associated with developing this giant."

Once again I could find no objections to this argument. Without the future clearly defined, without a theoretical and experimental foundation, it is impossible to remain at the crest of scientific-technical progress. And if we add the opinion of the USSR Gosplan, which was presented to me by V. Slavin, chief of the power engineering and electrification department, and which considers, besides everything else, the important role this line is to play in raising the reliability of the entire power supply system, no more doubt remains: Our power supply system needs the LEP-1500. Does this mean, then, that the USSR Gosstroy erred in its proposal to mothball it? Not at all.

There is no paradox here if we recall the rate at which this line is being built. Initially the first generation was to be placed into operation in 1984, with all construction being completed in 1987. Later on these deadlines were postponed correspondingly to 1985 and 1990. And finally, the USSR Ministry of Power and Electrification proposed stage-by-stage construction: Erecting an experimental section extending 100 kilometers from the Ekibastuzskaya substation in 1986, completing the first generation in 1988, and finally finishing the construction in 1990. But even these lenient deadlines are not being met. In 7 years, only 27 kilometers have been made ready for work, and this does not include the substation. Troubled by the state of affairs, the USSR Gosplan sent its own expert to Ekibastuz in August. He returned with the most gloomy impressions: The Ekibastuzenergostroy Trust was channeling manpower and materials into this construction project on lowest

priority. As a result only 3 percent of the annual plan of construction and installation was completed in 7 months. But the trust is not to blame either: All of its capacities had been committed to building the Ekibastuzskaya GRES-2. Meaning that judging from everything, the schedule for stage-by-stage construction of the power transmission will not be met, as was true with all previous schedules.

My conclusion was confirmed by S. Lyasotskiy, deputy chief of the Glavvostok-elektrosetstroy [not further identified] of the USSR Ministry of Power and Electrification.

"We cannot deal seriously with this line until we are freed from some of the other projects," Svyatoslav Vladimirovich categorically declared. "And we cannot get permission to do so."

Everyone I spoke to who defended the idea of erecting the LEP-1500 was indignant with the snail's pace of this facility's construction. But no organization has come up with practical ways to accelerate construction of this facility. Thus the sole concrete proposal that has been made thus far comes from the USSR Gosstroy, which is concerned by the fact that sizable assets are frozen in highly complex equipment lying exposed to the open sky and in scarce materials that are lacking at other places.

If this is so, then there is a direct argument for accepting this proposal: to not disperse manpower and materials, and instead to concentrate them on a limited quantity of the most important projects. This is precisely how the task is posed in the draft Basic Directions: "Beginning with the 12th Five-Year Plan, insure construction and commissioning of facilities within standard deadlines. Significantly reduce the quantity of facilities simultaneously under construction, and bring construction progress and incomplete construction to the standard level." And were we to comply with this provision, we would obviously have to postpone construction of the LEP-1500 until all of the other facilities that would insure maximum effectiveness of its operation are completed. All the more so because the situation on the country's power supply map would become completely clear after that.

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## NON-NUCLEAR POWER

### CONSTRUCTION OF VILYUYSKAYA GES IN WEST YAKUTIA

Moscow PRAVDA in Russian 25 Nov 85 p 1

[Article by PRAVDA correspondent V. Yermolayev: "At the Vilyuy Rapids"]

[Text] Eighty kilometers north of Mirnyy among the hard-woods, pines, and birches is Yakutia's newest settlement, Svetlyy. In it live the construction workers of the third Vilyuyskaya hydropower plant. First to arrive here was the brigade of O. Kharev, meritorious worker of the autonomous republic. This labor brigade has participated in the construction of two Vilyuyskaya GESes.

At the new location the brigade at the beginning worked on the watch method—people came 100 kilometers from the settlement of Chernyshevskyy. But today, close to the Ochchuguy-Botuobuy River, which carries its frigid water to the Vilyuy, there are dozens of residential buildings, a secondary school, a dormitory, a personal service shop, a club, stores, and a dispensary. A music school has also opened.

"Within the next few years the population will triple" said the chairman of the Mirnyy town executive committee, P. Kirillin, on the way to Svetlyy. "The settlement will have a House of Culture, a stadium, and a hospital."

Thanks to the care taken about the workers' living conditions here, strong labor collectives have formed. Two thousand people are already working in Svetlyy. They have long firmly tied their fortunes to the North and made themselves at home. The O. Kharev Brigade, for instance, has acquired a greenhouse.

The GES is being built not far from the settlement, just below the rapids. In the past small fragile ships were frequently wrecked here. The stone dam of the power plant partitions a narrow canyon. The core will be concrete. Half a million cubic meters of concrete remains to be poured. The work is proceeding under difficult natural conditions. The right bank of the Vilyuy consists of mud and marl, and is liberally strewn with boulders. Forty percent of the ground is perpetually frozen. The opposite bank also promises to be lots of trouble. In its slopes are many hollows filled with ice.

"Nevertheless we are convinced that the site of the dam was correctly chosen," says the chief engineer of the construction administration of the GES,

P. Pisarenko. "And not only because at the rapids the width of the river is minimal. If the plant were erected higher, the water pressure would be lower, and so would the productivity of the generating equipment. To build lower would not be worth it: it would increase the inundated area."

Pavel Ivanovich was well-trained in Ust-Ilimsk, constructing the powerful hydropower plant at Angara and a giant timber industry complex. The secretary of the party committee administration, A. Terekhov, also participated in creating a hydrosystem. So did many other experienced specialists here. All of them have to solve a special problem: for the first time construct a GES on a non-rock, permafrost foundation.

We stand on the right bank of the turbulent, unusually sinuous river. At this place the Vilyuy does not have long to flow in its age-old channel. With the construction of the dam the river will be constricted. The water will go through a channel almost a kilometer long. To make it, the construction workers will move almost 3 million cubic meters of rock. Half of the project is already done.

The Yakut ASSR komsomol shock workers collective is finishing construction of a factory for reinforced concrete products and other facilities of the industrial base. The plans from the beginning of the five-year plan have been overfulfilled, but you couldn't call them intensified plans. There is a lot of slack for achieving an even tighter schedule. But it is necessary to support the northerners with all that is required.

The designed capacity of the future plant is 360,000 kilowatts. Four turbines for it have been produced by the Leningrad Metal Works Association, and generators by Uralelektrotyazhmash in Sverdlovsk. The workers hope that the suppliers won't let them down, that they will fill orders on time and with high quality goods.

Although two existing hydropower stations also supply electric power to several districts, miners and prospectors in western Yakutiya are experiencing a keen shortage. The start-up of one more GES will hasten the development of the natural resources.

12805/12859  
CSO: 1822/115

NON-NUCLEAR POWER

POWER-LINE WORKERS EXPRESS VIEWS ON JOB-RELATED ACCIDENTS

[Editorial Report] A survey of power line workers at the Neyskoye Power Network Plant revealed that 18 percent of employees under 30 years of age, 26 percent of the 30-45 year age group and 15 percent of the 45-60 year age group believe that it is not possible to work at power installations without violating the safety rules, according to a 1000-word article by V. V. Vaskov in Moscow ENERGETIK No 1, January 1986 pages 36-37. The author of the article claims, moreover, that the majority of cases of injury occur due to violations of safety rules by employees. The employees at the plant, which is part of the Kostroma Power System, were queried about their attitudes in an anonymous questionnaire. When asked whether they had personally experienced an electric shock, 41 percent of the two younger groups and 33 percent of the older group answered affirmatively.

CSO: 1822/166



NON-NUCLEAR POWER

BRIEFS

NEW POWER LINE--The preoperational testing has been done on a new electric power transmission line from Sayano-Shushenskaya GES to Kuzbass. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 45, Nov 85 p 3] 12805/12859

NEW LINE TO GAS FIELD--Work has begun to go more smoothly at the Ekiz-Ak gas condensate field in western Turkmenistan. A multi-kilometer electric power transmission line to here was plugged in to the Central Asian grid. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 47, Nov 85 p 3] 12805/12859

LINE TO CAPITAL--A 750 KV power line and the Kaluzhskaya substation have been placed under load. Constructed almost twice as fast as scheduled, they are designated for the transmission of power from the Smolensk AES. Right now they are putting in the last masts of a 152 kilometer 500 KV line from Konakovo to Trubino, which will connect power from the Kalininskaya AES. [By Yu. Kalinnikov] [Excerpts] [Moscow IZVESTIYA in Russian 30 Nov 85 p 4] 12805/12859

SPEED-UP AT SAYANO-SHUSHENSKAYA GES--Krasnoyarsk Kray--On the control panel of the Sayano-Shushenskaya GES is affixed a number--49.5 billion. This is the number of kilowatt-hours of Sayano-Shushenskaya power that had to be produced by the workers for the Eleventh Five-Year Plan. They have been able to cope with the government assignment ahead of schedule. Since the start-up of the first unit of the Sayano-Shushenskaya GES in December of 1978 almost 80 percent of the cost of construction has been repaid. With completion nearing, the tempo of construction of the hydropower station is steadily increasing. It is known that this September the second unit of the Maynskaya GES started up, which idled the ninth generator at Sayano-Shushenskaya, while a few days ago the rotor of the last, tenth unit was lowered into the shaft. The principal accomplishments of the year are still ahead. In December the construction and energy workers must start up the ninth and tenth hydro units of Sayano-Shushenskaya and the third unit of the Maynskaya GES. They intend to accomplish this by the 65th year of the GOELRO plan on 22 December. [By IZVESTIYA stringer A. Shcherbakov] [Excerpts] [Moscow IZVESTIYA in Russian 6 Dec 85 p 1] 12805/12859

DAM ON THE KATUNA--(TASS) Gorno-Altaysk--A stream of power--six billion kilowatt-hours per year--will flow into the common power grid of Siberia with the start-up of the Katunskaya GES in Altay. Its construction has been called for by design in the Basic Trends of Economic and Socialist Development of the Country. "In the settlement of Mayma, where the hydro construction workers'

7 March 1986

support base is, industrial facilities and several apartment houses have already been constructed" said V. Usachev, head of Katungesstroy. "A vehicle access road and an electric power line to the site are being constructed and a construction industry created." The Leningrad designers picked a fortunate site for the GES. Here, a few tens of kilometers from Gorno-Altaysk, the banks of the turbulent Katuna come very close together. This makes possible, at minimum cost, the damming of the river with a 200-meter high dam. [Text] [Moscow IZVESTIYA in Russian 3 Dec 85 p 1] 12805/12859

IVANOVSKAYA GRES REFITTED--Ivanovskaya Oblast--A new gas turbine unit with a power of 107,000 kilowatts has been started up at the Ivanovskaya GRES. The old Ivanovskaya GRES, constructed more than half a century ago under the Lenin plan GOELRO, is now experiencing a second youth. Not long ago a new roomy shell was constructed where a new gas turbine unit was assembled in a short time. There still remains the operational testing of the unit. This is necessary for the successful start-up in the future of two more of these units at the plant. During the reconstruction the Ivanovskaya GRES was converted from hard coal to liquid fuel. The new gas turbine units are intended for use during the higher peak loads of morning and evening hours, when the consumption of electric power rises sharply. It is characteristic of this type of gas turbine to be completely automatic, which allows it to start quickly every time. It is operated entirely from a central panel. [By A. Yershov, IZVESTIYA stringer] [Text] [Moscow IZVESTIYA in Russian 14 Nov 85 p 1] 12805/12859

KHABAROVSKAYA TETs START-UP--Khabarovsk--The first power unit of the Khabarovskaya TETs-3 is commencing operation. When producing at design capacity, it will be the largest thermal electric power plant in the Far East. Construction workers from the Urals, Siberia, and the Far East participated in the erection of the TETs, the shell of which was constructed not far from the city in only 3 years. During this time a well-organized settlement with all necessary services was built nearby for the operating workers. [By V. Dolgodvorov] [Text] [Moscow TRUD in Russian 21 Nov 85 p 1] 12805/12859

IVANOVSKAYA GRES'S NEW GAS TURBINE--The first 107,000 kilowatt gas turbine at Ivanovskaya GRES is commencing operation. The start-up of the new unit coincided with the 55th anniversary of the thermal plant, which was constructed under the Lenin plan GOELRO. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 47, Nov 85 p 3] 12805/12859

NEW UNIT AT SURGUTSKAYA GRES-2--(TASS)--The next power unit of Surgutskaya GRES-2, with a capacity of 800,000 kilowatts, has been connected to the grid. It was assembled significantly in advance of the planned date. With the coming on line of the plant's new generator, fueled by the associated gas of the Middle Ob oil fields, the electric power picture of the northern parts of the Tyumen oil and gas producing region has improved. In the photograph: at the control panel of Surgutskaya GRES-2. At work is technician-machinist A.P. Sosykin. From here is controlled all of the intricate power systems of the plant. [Text] [Moscow IZVESTIYA in Russian 20 Nov 85 p 1] 12805/12859

ALEKSANDROV DAM COMPLETED--Nikolayevskaya Oblast--In the construction of the Aleksandrovskiy hydro system, one of the facilities of the southern Ukraine power system, an important stage of work has been completed: the last cubic meter of fill was laid on the earth dam joining the banks of the Southern Bug. Now the river has been directed to a new course. [By A. Kolesnik] [Excerpt] [Kiev RABOCHAYA GAZETA in Russian 29 Oct 85 p 1] 12805/12859

TYUMEN POWER STATION DELAYS--Moscow Domestic Service in Russian at 0700 GMT on 26 November broadcasts a report by correspondent (Mikhail Kollegov) on delays in construction work on the first set of generators at the Tyumen thermal power station. (Kollegov) opens his report by saying that the new station is planned to supply heat to the rapidly growing administrative and industrial center of Tyumen and to supply current to the West Siberian, Urals and Kazakhstan power supply grid. He points out that although construction work on the station was started in 1981, full technical documentation failed to arrive until 2 years later, by which time work was already behind schedule. (Kollegov) concludes his report by saying that the problems with the construction of the first stage of the station have been defined, and much is being done to correct the shortfall, but there are other generating sets to be built: the total planned capacity for the station is more than 1 million kilowatts. [Editorial Report] [Moscow Domestic Service in Russian 0700 GMT 26 Nov 85 LD] · 12624

CSO: 1822/185

## ENERGY CONSERVATION

### AERIAL PHOTOGRAPHY AIDS MOSCOW CONSERVATION EFFORTS

Moscow IZVESTIYA in Russian 23 Dec 85 p 1

[Article by L. Mariyeva: "Under the Wing--Moose Island"; first paragraph is IZVESTIYA introduction]

[Excerpts] At the peak of this year's cold weather, the specialists of Aerogeologiya and aviators are creating an unusual map of the city that is helping to conserve heat and protect the environment, reports L. Mariyeva, IZVESTIYA special correspondent.

"The flight in which you are to participate," as Yu. Litvinov, manager of the subdivision of the Moscow expedition of the Aerogeologiya association briefed me the day before, "is dedicated to one of the first planned thermal surveys of the city. We have worked out means of obtaining photographs of the necessary quality and of transforming them with the aid of computers from black and white to color images, and we have debugged some complex equipment.

The infrared aerial survey now helps the managers and workers of Moscow city services to prevent heat leaks from buildings and supply lines, to reveal contamination of reservoirs by industrial wastes, and to uncover the sources of self-ignition at peat bogs and places where domestic wastes are transported.

The Vulkan complex detects from above temperature changes with an accuracy of within 1 degree. Therefore, any thermal gradients on the surface of the ground and water or in pipelines and transport arteries show up on the photographs as colored blotches against the background of the general "normal" temperature of the objects. Thus, damage to the insulation in the lines of heat and electric power stations appears on the film as bright flashes and the disposal of production wastes into a river, being warmer than the water there, spreads into a light "blot," exposing the violating enterprise. It was in just this way, for example, that two serious discharges that polluted the stream Nishchenka were revealed.

A profusion of colored light bulbs on the instrument stand mounted in the aircraft cockpit suddenly lit up in front of on-board operator S. Anipko. With a flip of a tumbler switch, a camera over the open hatch began to work.

"System on!" Sergey reports to A. Volkovitskiy, supervisor of the air survey group, together with whom he manages the on-board work of the Vulkan thermal-vision complex.

I see how the luminous rotor noiselessly began to revolve on the roll with the film recording the thermal depiction of Moose Island Park and the ribbon of Yaroslavskoye Highway drifting by below. It seems that the minutes before the next turn of the IL-14 pass in an instant and everything repeats itself until dozens of meters of film have been shot.

It is planned in the near future to equip a laboratory with facilities revealing the pollution of the air with various gases and aerosols. This will expand the range of observations on the purity of the natural environment.

Without anyone noticing it, dusk thickened while our aircraft furrowed the skies over the zone of the survey.

"Darkness is no hindrance," they told me, "a comparison of day and night photographs will yield quite a lot of information."

The land below is already quite invisible. It seems that the signal lights of the spire of Ostankinskaya Television Tower are shining somewhere quite nearby. As if leaning into it with its left wing and gaining support for the next turn, the aircraft wearily heads back--to Bykovo.

It has been decided to make regular thermal surveys so as to be able to compare the state of the investigated sectors into which the territory of the capital has been divided. It is expected that the work will take several years.

9746  
CSO: 1822/148

## ENERGY CONSERVATION

### RESULTS OF ENERGY CONSERVATION EFFORTS FOR END OF 1985

#### Natural Gas

Moscow EKONOMICHESKAYA GAZETA in Russian No 46, Nov 85 p 16

[Article by V. Tikhonov: "How Fuel and Energy Resources Are Used: Natural Gas"]

[Text] The gas industry has confidently begun a new fall and winter period. During the first 9 months, 7.8 billion cubic meters of gas above the plan have been extracted and delivered to the national economy. Essential reserves of this fuel have been established in underground storage areas. The planned measures for the preparation of facilities for the extraction, processing and transport of gas for work under winter conditions have essentially been completed. In the completion stage is the construction and installation and start-up work at the last three compressor stations of the Urengoy-Tsentr. II gas pipeline, the activation of which will make it possible to reach the planned load of this gas transport system and to increase the supply of gas to the country's central regions by 20 to 25 million cubic meters per day.

Thanks to the measures taken by the Ministry of the Gas Industry, the Mubarekskiy Gas Processing Plant began to work more reliably, which permitted the Soyuzuzbekgasprom Association to achieve the daily plan for the extraction of gas.

At the same time, with the onset of the fall period, shortcomings have again appeared in the planning of the distribution of this type of fuel. Regions where the limits were raised have attained an unjustified saving that exceeds the daily demand by a factor of four or more.

A similar situation prevails in several ministries. Thus, in the Ministry of Mineral Fertilizer Production, the October consumption of gas was 10 percent below the allocated funds, and it was 6 percent below in the USSR Ministry of Ferrous Metallurgy and the Ministry of the Chemical Industry. At the same time, individual enterprises of these ministries fell 20 to 30 percent short of their limits. The consumption of gas is uneven. This feature is not being given adequate consideration in the distribution of the fuel.

A more distinct and thorough differentiation is also required in determining the monthly limits for municipal and domestic consumers, where the unevenness of utilization is greater than in industry.

The experience of the work in October again confirmed the necessity of a monthly distribution of funds for gas taking into account the existing unevenness. Such a system has been adopted. It is not, however, being adhered to everywhere.

The period is approaching when the accuracy and validity of the planning of natural gas consumption will be just as important as its economical consumption, and more attention needs to be paid to this question at all levels in the management of the process of the utilization of fuel and energy resources.

#### Further on Natural Gas

Moscow EKONOMICHESKAYA GAZETA in Russian No 50 Dec 85 p 4

[Article by V. Tikhonov: "How Fuel and Energy Resources are Used: Natural Gas"]

[Text] The gas industry has entered the winter period with good indicators. During the first 11 months, 9 billion cubic meters of gas have been extracted above the plan, including 1.2 billion cubic meters in November. The tasks in increasing the deliveries of gas fuel to consumers with the coming of colder weather are being fulfilled completely. For this purpose, its removal from underground storage areas has begun.

In November, the absolute majority of oblasts, krays and republics strictly observed state discipline in gas consumption and reduced the consumption of gas relative to the allocated limits. At the same time, there was above-plan production of gas amounting to more than 5 percent of the monthly funds in Tyumen, Tomsk, Kharkov, Kherson, Chernigov and several other oblasts.

Of great importance is the saving of gas in power installations, shops and services and at enterprises and organizations. As a check carried out by the authorities of State Gas Inspectorate showed, however, this work is not being performed satisfactorily in a number of sectors of the national economy.

The inspection of 1,440 enterprises of various sectors revealed some completely intolerable things. It turned out, for example, that half of the enterprises checked do not have annual targets for the saving of fuel and energy resources, there are no standards for the consumption of fuel at one-third of the enterprises, at 240 enterprises the standards in effect exceed the indicators actually achieved in 1984, and two-thirds of the enterprises present distorted reports on the consumption of fuel and energy or do not report at all.

Of 11,800 installations that use gas, about half were not adjusted for the optimum burning of fuel, and 40 percent operated without using the means of automation. The situation was worst at the enterprises of the ministries of

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railways, civil aviation, the communications equipment industry, and housing and municipal services.

Many machine building enterprises are still using obsolete heating and thermal equipment with an efficiency not exceeding 0.15. As a result, the specific expenditures of fuel in the processes of heating and thermal treatment are two to three times higher than in advanced domestic enterprises and abroad.

At the same time, problems in the production of new highly efficient gas-utilizing equipment are being resolved only slowly. Thus, the construction of the Fastov plant for gas and fuel-oil facilities and gas-utilizing apparatus begun in 1977 by the Ministry of the Gas Industry has still not been completed. And although only 30 percent of the planned capacity has been made operational, work to complete the construction of this enterprise has not been included in the plan for 1986. In the opinion of specialists, the introduction of new equipment planned for production at this plant would make possible an annual saving in the national economy of as much as 2.5 to 3 billion cubic meters of gas.

#### Better Utilization of Gas Sources

Moscow EKONOMICHESKAYA GAZETA in Russian No 2 Jan 86 p 4

[Article by V. Tikhonov: "How Fuel and Energy Resources Are Being Used: Natural Gas"]

[Text] The gas industry has successfully completed the 11th Five-Year Plan. The targets for the extraction of gas and for an increase in the volume of production and in labor productivity were fulfilled on 9 December. More than 10 billion cubic meters of gas were produced above the plan for 1985, including 1 billion cubic meters last month.

Significant work was done in the development and reconstruction of the system for the distribution of gas fuel. Its delivery increased by a factor of almost 1.5, including by a factor of almost 2 for the generation of electric power to agriculture and 1.4 to the chemical industry and by a factor of 1.3 for municipal and domestic services. At the present time, gas accounts for one-third of the country's fuel balance.

All the more important are the questions of the better utilization of gas sources and fuel and a thrifty attitude toward this valuable product. An analysis shows that state discipline in gas consumption in 1985 was strictly observed in the Belorussian, Georgian, Kazakh and Estonian SSR's, in the Mordovskaya, Mariyskaya and Komi ASSR's, and in Kalinin, Volgograd, Voronezh, Tula, Lipetsk, Odessa, Voroshilovgrad, Cherkassy and a number of other oblasts.

At the same time, there are continuing violations of discipline in gas consumption in the Uzbek, Azerbaijan and Moldavian SSR's and in Kemerovo, Tyumen, Denpropetrovsk, Zaporozhye and several other oblasts. Here the use of gas over the allocated limits by industrial and municipal-domestic consumers



has become commonplace. In December alone, they had an excessive consumption of more than 250 billion cubic meters of gas.

In the first half of 1985, the authorities of the gas inspectorate checked 108 enterprises in Uzbekistan and Azerbaijan. More than half of them had no annual targets and measures for the saving of fuel and energy resources, and at 70 of them there were no standards for the consumption of fuel or they applied standards exceeding the indicators achieved in 1984. Ninety percent of the consumers examined did not prepare reports or distorted them. As the recent repeat checks showed, little more than half of the instructions of the authorities of the State Gas Inspectorate were fulfilled, and only one-third of them were fulfilled in Uzbekistan.

Such a situation cannot be tolerated in the future. It is essential in a very short time to take another close look at questions in the utilization of gas and other types of fuel at the sites and to outline and implement effective measures for strict observance of state discipline in the consumption of fuel and energy resources and for their intensified saving from the first days of 1986.

#### Electric Power

Moscow EKONOMICHESKAYA GAZETA in Russian No 46, Nov 85 p 16

[Article by V. Loginov: "How Fuel and Energy Resources Are Being Used: Electric Power"]

[Text] The fall and winter peak load period of the power systems is becoming more and more perceptible. This is reflected primarily in the amount of the capacity used, which is rapidly and steadily increasing. Under these circumstances, it is becoming more and more difficult to save electric power. The October results confirm this.

According to the data of operational accounting, electric power consumption in the country for the last month as a whole meets the planned target. The enterprises of the RSFSR, the Ukraine, Belorussia, Azerbaijan, Armenia, Latvia, Estonia, Kirghiz and Turkmenistan were within the allocated limits. Lithuania, Moldavia and Tajik were close. In Kazakhstan, Uzbekistan and Georgia, the excess consumption ranges from 0.5 to 2 percent.

There was a noticeable increase in the number of oblasts that were not within their allocated limits. Among them were Tambov, Lipetsk, Orel, Astrakhan and a number of other oblasts of the RSFSR, 10 oblasts in Kazakhstan, and 7 in Uzbekistan.

As before, of the industrial ministries, only the USSR Ministry of the Coal Industry violated the established limits. The number of enterprises exceeding them remained at the previous level but the amount of their excess electric power consumption declined by about 100 million kilowatt-hours.

The October results made it possible to maintain the overall quantity of electric power saved in the national economy during the preceding 9 months at about 6.4 billion kilowatt-hours.

It should be stressed, however, that the time is approaching when it will be possible to ensure the uninterrupted supply of power the national economy only if there is strict observance of the limits by all consumers without exception. Under these conditions, the role of operational discipline and the observance of the prescribed conditions of electric power consumption is increased. Meanwhile, a number of places have repeatedly increased the consumed capacity during the hours of peak load above the permitted quantities. Such instances have been recorded in the Tatarskaya and Bashirskaya ASSR's and in Belgorod, Saratov, Vinnitsa, Kustanay and a number of other oblasts.

It is essential to activate the work of the operational groups of the local soviets of people's deputies controlling the observance of the established conditions and limits for the consumption of electric power.

#### Utilization of Electric Power

Moscow EKONOMICHESKAYA GAZETA in Russian No 50, Dec 85 p 4

[Article by G. Georgiyev: "How Fuel and Energy Resources Are Being Used: Electric Power"]

[Text] In November, the maximum electric capacity of power systems increased by an average of 6 percent compared with the preceding month, which led to an increase in the strain on the power supply, especially during "peak" hours.

In accordance with the data of operational accounting, the consumption of electric power in the country did not exceed the planned target in November. Of the union republics, only the Azerbaijan SSR, the Moldavian SSR and the Kirghiz SSR had total excess consumption of about 53 million kilowatt-hours. An excess of 84 million kilowatt-hours beyond the established electricity-consumption limits for the month was also permitted by Bashkirskaya ASSR, Altayskiy Kray, and Vinnitsa, Khmel'nitskiy, Ternopol and Chernovtsy oblasts.

Among the power-intensive enterprises of industry and transport checked daily, November violators of the limits included 39 enterprises of the USSR Ministry of the Coal industry, 23 of the USSR Ministry of Ferrous Metallurgy, 15 of the USSR Ministry of the Construction Materials Industry, 14 of the Ministry of Mineral Fertilizer Production, 12 of the Ministry of Railways, and 9 of the Ministry of the Automotive Industry. They consumed an excess of more than 200 million kilowatt-hours of electric power.

The checks of 6,274 enterprises located in the Ukrainian SSR carried out in November by the authorities of the State Power Inspectorate revealed numerous instances of irrational utilization of electric power.

In Rostov Oblast, because they were unprepared for work under winter conditions, about 20 percent of the departmental heating boiler houses and

heating lines illegally used electric boilers and other electric heating installations of tremendous total capacity for heating. Thus, at the Rostov plant Elektrobytmash of the Ministry of Machine Building for Light and Food Industry and Household Appliances, the additional demand for thermal power arising as a result of its increased losses and the disrepair of the plant's thermal networks is covered by electric heating with a capacity of 285 kilowatts.

An analysis shows that shortcomings in ensuring the rational and economical utilization of electric power for production needs are above all the result of poor control of the work on the part of the operational groups of the local soviets of people's deputies, who, with the broad aktiv of working people, are called upon to observe the established conditions and limits for the consumption of electric power. Unfortunately, this apparently is not well understood in Guryev, Mangyshlak, Severo-Kazakhstan, Vostochno-Kazakhstan and Semipalatinsk oblasts of Kazakh SSR and in Moldavian SSR, where such groups are essentially inactive.

#### Need for Discipline in Power Use

Moscow EKONOMICHESKAYA GAZETA in Russian No 2, Jan 86 p 4

[Article by G. Georgiyev: "How Fuel and Energy Resources Are Being Used: Electric Power"]

[Text] The results of the work in 1985 show that the stability of the power supply was increased and that for the first time in recent years the established limits for power consumption were observed. The most significant contribution to the strengthening of the energy balance was made by the enterprises and organizations of union subordination that consumed 12 billion kilowatt-hours less than planned last year. The excessive consumption of electric power by enterprises and organizations of local subordination was cut almost in half.

In December, the electric load reached a peak. Nevertheless, the power systems as a whole ensured a more reliable and higher-quality power supply to consumers than before.

According to the data of the operational accounting, the consumption of electric power in the national economy last month did not exceed the established limit. Overconsumption was noted, however, at enterprises and organizations located in the territory of Uzbek and Tajik SSR's and Amursk, Belgorod and Volgograd oblasts. Among the large consumers checked daily, 480 enterprises had an overconsumption of more than 600 million kilowatt-hours.

In winter, there has been a sharp increase in the importance of the strict observance by each enterprise of the conditions for the utilization of power, especially during the hours of peak load. Nevertheless, they continue to exceed the electric capacity limit in the Ukraine, Kazakhstan and Georgia, in the Bashkirskaya ASSR, in Stavropol and Krasnodar krays, and in Chelyabinsk, Sverdlovsk, Belgorod and Kirov oblasts.

The authorities of the power inspectorate revealed an irrational consumption of electric power on the order of 152 million kilowatt-hours annually at enterprises and organizations. The most serious cases of wasteful consumption of electric power were noted in Moldavia and in Voronezh and Sverdlovsk oblasts.

These things indicate the need for an even more persistent struggle for the general strengthening of discipline in power consumption.

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## ENERGY CONSERVATION

### BRIEFS

PETROLEUM PRODUCTS SALES VIOLATIONS--The system for the storage and issue of petroleum products and the reliability of their accounting is being grossly violated at the petroleum bases and motor vehicle filling stations of the Khabarovsk territorial administration of the RSFSR Goskomnefteprodukt (director G. Mazmanyen). A check has revealed a large number of surpluses of fuel and lubricants, which creates the conditions for their plundering and squandering. The territorial administration is consistently failing to fulfill the plan for the sale of petroleum products through the motor vehicle refueling stations. For 9 months, it was only 87.6 percent fulfilled. The committee severely reprimanded G. Masmanyen for his demonstrated lack of discipline in fulfilling the demands of the guiding authorities in regard to the preservation of petroleum products. V. Tarakanov, chairman of the RSFSR Goskomnefteprodukt, has been entrusted with the taking of measures to establish order in the Khabarovsk administration and to put the idle petroleum bases into operation this year. [Excerpts] [Moscow IZVESTIYA in Russian 6 Dec 85 p 2] 9746

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STATISTICS ON USSR, MOSCOW RURAL POWER SUPPLY

Moscow TEKNIKA V SELSKOM KHOZYAYSTVE in Russian No 11, Nov 85 pp 28-29

Article by A.P. Shushtanova, engineer at USSR Ministry of Power and Electrification: "Raising the Reliability of Agricultural Power Supply"

Text During 4 years of the 11th Five-Year Plan, the consumption of electric power in agriculture increased by 23 percent and reached 137 billion kilowatt hours in 1984, or 10 percent of the country's overall consumption. During the 1981-1984 period, construction was completed on 450,000 kilometers of rural electric power networks having a voltage of from 0.38 to 110 kilovolts, the overall length of which exceeded 4 million kilometers; the number of substations reached 900,000 with an overall capability of 240 million kilovolts. A considerable improvement took place in the structural quality of the electrical power networks of an agricultural nature under construction. Overhead lines with a voltage of from 35 to 110 kilovolts are being erected using mainly reinforced concrete or steel; the proportion of networks under construction with voltages ranging from 0.4 to 20 kilovolts is 64 percent.

A reserve electric power supply of the first category of reliability has been established for more than 4,000 consumers. This includes livestock husbandry complexes and farms, poultry factories and hothouse combines. Towards this end, 3,400 twin-transformer TP's transformer substations, 1,900 remotely controlled 35-110 kilovolt substations and 19,000 6-20 kilovolt feeder lines equipped with APV's automatic reclosers and AVR's automatic reserve switches were built.

The high quality structure of the electric power networks also included the capital repair of the electrical networks. This responsible and laborious work was associated with the well-known shortage of materials. During the current five-year plan, the volume of capital repair work amounted to 517 million rubles (111 percent of the plan). Improvements were noted in the indicators for reliability as a result of measures carried out in the rural electric power networks. For example, the number of 35-110 kilovolt substations with reserve power increased from 45 percent of their overall number in 1980 to 54 percent in 1984; twin-transformer substations -- from 41 percent to 47 percent; those equipped with remote control -- from 29 to 37 percent; 6-10 kilovolt feeder lines with reserve power -- from 58 to 62 percent.

However, we are still unable to consider the reliability of the rural electric power networks as sufficiently satisfactory. The number of disruptions in the delivery of electric power is still quite considerable. On the average for the

country as a whole, there are 4-5 disruptions per farm annually. An analysis of these disruptions reveals that they occur mainly as a result of unfavorable meteorological conditions. At the present time, there is a large number of lines with voltages ranging from 0.4 to 20 kilovolts in operation that are considered to be unsuitable for use. One reason for this is the low technical condition of the existing lines: poor saturation of the wood with antiseptic compounds, failure of the insulators to meet the operational requirements and a number of other reasons.

The operational experience of rural electric power networks and the experience of leading energy systems reveal that it is impossible to achieve a high degree of reliability and economy in the power supply for rural consumers through individual measures. The most effective means is the efficient development of a primary electric power plan for the rural networks, equipped with systems for automation and remote control.

At the present time, many energy systems have accumulated a considerable amount of experience in the automation of rural electric power networks and many instruments, units and other items of technical equipment have undergone testing. For example, during the years of the 10th and 11th five-year plans, enterprises of electric power networks of the UkSSR Minenergo /Ministry of Power and Electrification/ carried out a volume of work concerned with introducing automation equipment into operation in rural distribution networks. Prior to the end of the five-year plan, the automation of distribution networks will have been completed at 35 support-demonstration RES's /rayon electric power plants/. A great amount of work is being carried out in the Belorussian energy system, especially in Grodenergo, with the Grodno PES /enterprise electrical networks/ being the basic unit within Belglavenergo /Main Power Supply Administration for the Belorussian SSR/ for the introduction and mastering of automation equipment in the distribution networks.

The Moscow energy system for providing electric power for agriculture consists of 50,000 kilometers of lines with voltages ranging from 0.4 to 10 kilovolts, 10,500 6-10/0.4 kilovolt transformer substations with an established capability of approximately 4 million kilovolts, 428 35-110 kilovolt transformer substations, of which number two transformers have dual power supply -- 395 units (90 percent) and remote control -- 321 (75 percent), of three 6-10 kilovolt feeder lines 90 percent are mutually reserved. A great amount of work is being carried out at Lenenergo, Bashkirenergo and a number of other energy systems in connection with the introduction into operations of automation and remote control equipment.

The equipping of electric power networks with systems for automation, remote control, communications, computing equipment, micro computers and the creation of an automated system for dispatcher control over the networks will make it possible to control the status of 6-10 kilovolt lines directly from a dispatcher point and to analyze the operation of a network with the aid of a computer: the frequency of disconnections for each line, their duration and the nature of the damage and causes; measures must be planned for raising the reliability of the electric power supply system and also for avoiding emergency situations. These measures will produce a considerable economic effect. For example, automation of the networks of the Grodno rural and the Shuchinskiy RES of Grodenergo made it possible to realize a savings of 120,000 rubles worth of capital investments for ensuring the reliability of the electric power supply for agricultural consumers.

The conversion over to the mass introduction of automated distribution networks will require the establishment of a single system, obligatory for all subunits, for the carrying out of all-round programs aimed at raising the reliability of rural electric power networks. A single technical policy must be followed in matters concerned with the planning, designing and carrying out of installation and start-up and adjusting operations and organizing the operation of new technical equipment for controlling and automating the rural networks. This work is under the direction of the Administration for the Electrification of Agriculture of USSR Minergo. The Selenergoprojekt Institute, the leading organization for these matters, must establish the technical policy both for planning and developing the networks and for developing and introducing new equipment, instruments and resources for automation and remote control. In addition, it must study the operational status of the rural electric power networks and direct the work concerned with improving the repair and operational services for them.

The work associated with the automation of distribution networks must be carried out in the following order. In a number of energy systems, the existing 0.4 to 20 kilovolt networks are unsuitable for the installation of automation equipment. They must first be made technically and reliably suitable; they must undergo modernization or technical re-equipping.

The Selenergoprojekt and Energosetproekt institutes, in accordance with orders handed down by the energy systems, must prepare plans for the RES electric power networks.

Each year, in accordance with the requests of the energy systems, these same institutes will develop working plans for the modernization or technical re-equipping of those electric power networks to be placed in operation during the year planned. These plans must define the volumes of automation and remote control and they must also be taken into account in the plans for the new construction of lines.

When preparing the annual plans for the construction and modernization of rural electric power networks within energy systems, provision must be made for the volumes of automation and remote control in the RES networks, within the limits for the capital investments allocated for the year planned for the "agricultural" branch, for the construction and modernization of rural electric power networks, and also allocated on a centralized basis taking into account the instruments, units and other items of automation and remote control equipment produced using one's own resources.

In order to raise the consumption of electric power in agriculture to 210 billion kilowatt hours annually by 1990 and also in the interest of raising the level of reliability for supplying rural consumers with electric power, it will be necessary during the next five-year plan to carry out a great amount of work directed towards strengthening and developing the power engineering base in the rural areas. The plans call for an increase in the volumes of work concerned with the modernization and capital repair of electric power networks and also their automation and remote control; to convert over to the construction of underground cable lines in regions of irrigated farming and also in the case of especially valuable lands; to achieve an improvement in the



mechanical stability and durability of overhead lines through an increase in the volumes of use of steel-aluminum wire and the construction of 0.4-20 kilovolt lines on reinforced concrete supports.

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TECHNICAL FILMS ON POWER RESOURCES AVAILABLE IN USSR

[Editorial Report] A list of new scientific-technical films, produced on order by the USSR Ministry of Power and Electrification and the USSR Ministry of Power Machine Building and said to be currently available in rayon film-rental offices, is published on page 55 of Kiev ENERGETIKA I ELEKTRIFIKATSIYA in Russian No 4, October-December, 1985. The 2-hour films include: "Paths to Fuel and Power Resource Economies", about the efforts of several power machine-building plants, such as the Nevskiy and Izhora plants, to conserve power resources; "Construction of the Hoa Binh GES in Vietnam", about the Soviet role at this site and economic and energy developments in northern Vietnam; "Servicing TETs and GRES Turbine Equipment", by the Lower Volga Film Chronicle Studio, concerning turbine factory equipment and the thermal scheme of a power block, and which depicts cross-sections of a turbine and some basic equipment.

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